REMARKS

Claim 1 has been amended to describe a shaped article capable of withstanding high mechanical stress produced from a cellular polyurethane elastomer having a density of from about 0.2 to about 1.1 g/cm^3 which is composed of the reaction product at least one higher molecular weight polyhydroxyl compound, at least one 2,3,5,6-tetramethyl-1,4-diisocyanatobenzene and water and/or at least one low molecular weight chain-lengthening and/or crosslinking agent. Support for this amendment is found in the specification on page 4, lines 8-20, as well as on page 5, lines 16-22 and on page 8, lines 8-9.

Claim 2 has been amended to describe a process for producing the shaped article of Applicants' claimed invention. Support for this amendment is found in the specification on page 7, lines 14-28.

Claim 3 has been amended to place the claim in better form. Specifically, the word "a", which appears before the words "chain lengthening agent", has been deleted. In its place, the word "the" has been inserted.

Claim 4 has been cancelled from the Application.

New Claims 5-11 have been added to the Application. Support for new Claim 5 is found in the specification on page 4, lines 8-20, as well as on page 7, lines 4-6 and on page 8, lines 5-7.

Support for new Claim 6 is found in the specification on page 5, lines 6-14.

Support for new Claim 7 is found in the specification on page 7, lines 12-14.

Support for new Claim 8 is found in the specification on page 6, lines 1-8.

Support for new Claim 9 is found in the specification on page 4, lines 8-20, as well as on page 7, lines 4-6 and on page 8, lines 7-9.

Support for new Claim 10 is found in the specification on page 7, lines 12-14.

Support for new Claim 11 is found in the specification on page 6, lines 1-8.

Summary of the Invention:

Applicants' claimed invention is directed to shaped articles capable of withstanding high mechanical stress produced from cellular polyurethane elastomers having a density within the range of from about 0.2 to about 1.1 g/cm^3 which are composed of the reaction product of at least one higher molecular weight

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polyhydroxyl compound, at least one 2,3,5,6-tetramethyl-1,4-diisocyanatobenzene and water and/or at least one low molecular weight chain-lengthening and/or crosslinking agent.

Applicants' claimed invention is also directed to shaped articles capable of withstanding high mechanical stress produced from compact polyurethane elastomers having a density within the range of from about 1.0 to about 1.4 g/cm^3 which are composed of the reaction product of at least one higher molecular weight polyhydroxyl compound, at least one 2,3,5,6-tetramethyl-1,4-diisocyanatobenzene and at least one low molecular weight chain-lengthening and/or crosslinking agent, with the proviso that the reaction of the aforementioned components is carried out in the absence of moisture and/or blowing agents which have a physical or chemical blowing action.

Applicants' claimed invention is also directed to shaped articles capable of withstanding high mechanical stress produced from filler-containing compact polyurethane elastomers having a density greater than 1.2 g/cm^3 which are composed of the reaction product of at least one higher molecular weight polyhydroxyl compound, at least one 2,3,5,6-tetramethyl-1,4-diisocyanatobenzene and at least one low molecular weight chain-lengthening and/or crosslinking agent, with the proviso that the reaction of the aforementioned components is carried out in the absence of moisture and/or blowing agents which have a physical or chemical blowing action.

Shaped articles of Applicants' claimed invention are capable of withstanding high mechanical stress and are particularly useful for machinery construction and transport applications such as rollers, conveyor belts, gearwheels and seals.

Rejection of Claims 1-4 under 35 U.S.C. § 102(b):

The Patent Office rejected Claims 1-4 under 35 U.S.C. § 102(b) as being anticipated by DE 955,094 ("Windemuth et al."). The Patent Office believes that Windemuth et al. disclose, in Example 3, a polyurethane made by chain extending with water a prepolymer of a polyester and durene diisocyanate. This rejection is respectfully traversed.

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In order for a reference to anticipate, the claimed invention must be the same as that of the reference. *See* Glaverbel Societe Anonyme v. Northlake Marketing & Supply Inc., 45 F.3d 1550, 33 U.S.P.Q.2d 1496, 1498 (Fed. Cir. 1995). Applicants' claimed invention is not anticipated by Windemuth et al. because Applicants' claimed invention is different than the invention disclosed by Windemuth et al.

Example 1 Windemuth et al. describes a film which is obtained by reacting polyester (in ethyl acetate) and tetramethyl-p-phenylene diisocyanate. The diethylene glycol of Example 1 of Windemuth et al. is not used as a chain extender. It is used, however, to prepare the polyester.

Example 2 of Windemuth et al. describes preparing a viscous mass which is obtained by reacting polyester and tetramethyl-p-phenylene diisocyanate. The viscous mass is applied to a cloth in the form of a layer to produce a coated fabric. The coated fabric is then exposed to **ethylenediamine**.

Example 3 of Windemuth et al. describes exposing the coated fabric prepared according to Example 2 to water vapors and vapors of hexahydrodimethylaniline to produce a **flexible rubbery** film.

In contrast to Windemuth et al., Applicants claimed invention is directed to shaped articles capable of withstanding **high mechanical stress** produced from cellular polyurethane elastomers having a density of from about 0.2 to about 1.1 g/cm^3. Cellular polyurethane elastomers of Applicants' claimed invention are composed of the reaction product of at least one higher molecular weight polyhydroxyl compound, at least one 2,3,5,6-tetramethyl-1,4-diisocyanatobenzene and water and/or and at least one low molecular weight chain-lengthening and/or crosslinking agent **having at least two hydroxyl groups**.

Additionally, in contrast to Windemuth et al., Applicants claimed invention is also directed to shaped articles **capable of withstanding high mechanical stress** produced from compact polyurethane elastomers. Compact polyurethane elastomers of Applicants' claimed invention are composed of the reaction product of at least one higher molecular weight polyhydroxyl compound, at least one 2,3,5,6-tetramethyl-1,4-diisocyanatobenzene and at least one low molecular weight chain-lengthening and/or crosslinking agent, **with the proviso the r action of th**

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aforementioned components is carried out in the absence of moisture and/or blowing agents which hav a physical or ch mical blowing action. *See* the Application, page 7, lines 12-14.

Given that Windemuth et al. does not describe the same invention as Applicants' claimed invention, Applicants' respectfully contend that Windemuth et al. do not anticipate their claimed invention. Applicants, therefore, respectfully request that the Patent Office enter Applicants' amendment to Claims 1-3 and withdraw its rejection of Claims 1-3 under 35 U.S.C. § 102(b).

Applicants also believe that new Claims 5-11 are patentable under 35 U.S.C. § 102(b) in view of Windemuth et al. Thus, Applicants respectfully request that the Patent Office enter allowance of Claims 5-11 in addition to Claims 1-3.

Rejection of Claims 1-4 under 35 U.S.C. § 103(a):

The Patent Office rejected Claims 1-4 under 35 U.S.C. § 103(a) as being unpatentable over Windemuth et al. in view of *Saunders* and *Frisch*. The Patent Office believes that Windemuth et al. disclose, in Example 3, a polyurethane made by chain extending with water a prepolymer of a polyester and durene diisocyanate. The Patent Office concedes that Windemuth et al. is different from Applicants' claimed invention by not including a chain extender in the prepolymer step and by showing a coating rather than a shaped article.

The Patent Office, however, believes that it would have been obvious to one of ordinary skill in the art to use the elastomers of Windemuth et al. for shaped articles because Saunders and Frisch teach that cast elastomers can be used for both coatings and shaped articles. Also, the Patent Office believes that it would have been obvious to make the elastomers of Windemuth et al. by a one-shot method because Saunders and Frisch teach that both methods can be used and that the one-shot method would save time by eliminating an extra step.

In order to support a rejection based on obviousness, the prior art must provide a motivation or reason for the worker in the art, without the benefit of the Applicants' specification, to make the necessary changes in the reference invention. *See* Ex parte Chicago Rawhide Manufacturing Co., 226 U.S.P.Q. 438 (PTO Bd.

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App. 1984). There is no motivation to modify the polyurethane disclosed in Windemuth et al. to produce the shaped articles of Applicants' claimed invention.

As mentioned above, Example 2 of Windemuth et al. describes preparing a viscous mass which is obtained by reacting polyester and tetramethyl-p-phenylene diisocyanate. The viscous mass is applied to a cloth in the form of a layer to produce a coated fabric. The coated fabric is then exposed to **ethylenediamine**. Also, as previously mentioned, Example 3 of Windemuth et al. describes exposing the coated fabric prepared according to Example 2 to water vapors and vapors of hexahydrodimethylaniline to produce a **flexible rubbery** film.

Applicants claimed invention, on the other hand, is directed to shaped articles **capable of withstanding high mechanical stress** produced from cellular polyurethane elastomers having a density in the range of from about 0.2 to about 1.1 g/cm^3. Cellular polyurethane elastomers of Applicants' claimed invention are composed of the reaction product of at least one higher molecular weight polyhydroxyl compound, at least one 2,3,5,6-tetramethyl-1,4-diisocyanatobenzene and water and/or and at least one low molecular weight chain-lengthening and/or crosslinking agent **having at least two hydroxyl groups**.

One having ordinary skill in the art would have had no motivation to use water to extend polyurethane chains to produce shaped articles **capable of withstanding high mechanical stress** as disclosed by Applicants' claimed invention.

Applicants claimed invention is also directed to shaped articles **capable of withstanding high mechanical stress** produced from compact polyurethane elastomers. Compact polyurethane elastomers of Applicants' claimed invention are composed of the reaction product of at least one higher molecular weight polyhydroxyl compound, at least one 2,3,5,6-tetramethyl-1,4-diisocyanatobenzene and at least one low molecular weight chain-lengthening and/or crosslinking agent, **with the proviso the reaction of the aforementioned components is carried out in the absence of moisture and/or blowing agents which have a physical or chemical blowing action**. *See* the Application, page 7, lines 12-14.

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As mentioned above, Example 3 of Windemuth et al. describes exposing the coated fabric prepared according to Example 2 **to wat r vapors** and vapors of hexahydrodimethylaniline to produce a **flexibl rubbery** film. The disclosure of Windemuth et al., therefore, teaches away from Applicants' claimed invention.

Given the foregoing, Applicants contend that their claimed invention is patentable over Windemuth et al. in view of *Saunders* and *Frisch*. Thus, Applicants respectfully request that the Patent Office enter Applicants' amendments to Claims 1-3 and withdraw its rejection of Claims 1-3 under 35 U.S.C. § 103(a).

Applicants also believe that new Claims 5-11 are patentable under 35 U.S.C. § 103(a) over Windemuth et al. in view of *Saunders* and *Frisch*. Thus, Applicants respectfully request that the Patent Office enter allowance of Claims 5-11 in addition to Claims 1-3.

CONCLUSION

For the foregoing reasons, Applicants respectfully request that the Patent Office: i) enter their amendments to Claims 1-3; ii) cancel Claim 4 from the Application; iii) add new Claims 5-11 to the Application; iv) withdraw the rejection of Claims 1-3 under 35 U.S.C. § 102(b); v) withdraw the rejection of Claims 1-3 under 35 U.S.C. § 103(a); and vi) enter allowance of Claims 1-3 and 5-11.

Respectfully submitted,

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

In the Claims:

Claims 1-3 have been amended as follows:

1. (Twice Amended) A shaped article capable of withstanding high mechanical stress produced from a cellular polyurethane elastomer [prepared from a composition comprising:] having a density within the range of from about 0.2 to about 1.1 g/cm^3 which comprises the reaction product of:

a) from about 65 to about 90 wt.%, based on the total weight of reaction product, of at least one higher molecular weight polyhydroxyl compound having an average molecular weight of from 500 to 6,000 and a functionality of at least 2;

b) from about 10 to about 25 wt.%, based on the total weight of reaction product, of at least one 2,3,5,6-tetramethyl-1,4-diisocyanatobenzene; and

c) from about 0.2 to about 10 wt.%, based on the total weight of reaction product, of water and/or at least one low molecular weight chain-lengthening and/or crosslinking agent having at least two hydroxyl groups and an average molecular weight of from 60 to 800.

2. (Amended) A process for [the production of] producing the [polyurethane elastomer] shaped article of Claim 1 in which the higher molecular weight polyhydroxyl compound a) is first reacted with the diisocyanate b) to produce an isocyanate-terminated prepolymer and the prepolymer is then reacted with the chain-lengthening and/or crosslinking agents and/or higher molecular weight polyhydroxyl compounds.

3. (Amended) The process of Claim 2 in which [a] the chain lengthening and/or crosslinking agent c) is present during production of the prepolymer.

As explicitly set forth in **37 C.F.R. Section 1.21(c)(1)(ii), last sentence**, a marked up version does not have to be supplied for an added claim or a cancelled

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claim as it is sufficient to state that a particular claim has been added, or cancelled, and this has been so stated in the Amendment.

In particular, in this case, Claim 4 has been cancelled from the Application, while Claims 5-11 have been added to the Application.

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